SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name

R290, Tegan®290, Propane 2.5

Substance name	propane
REACH registration no.	01-2119486944-21-0089

Identification numbers

CAS no.	74-98-6
EC no.	200-827-9
Index no.	601-003-00-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Refrigerant
Aerosol
Propellant

Uses advised against
No data available.

1.3 Details of the supplier of the safety data sheet

Address
TEGA-Technische Gase und Gasetechnik GmbH
Werner-von-Siemens-Straße 18
97076 Würzburg

Telephone no.	+49 931 2093-220
Fax no.	+49 931 2093-180
e-mail	kaeltemittel@tega.de

Advice on Safety Data Sheet
sdb_info@umco.de

1.4 Emergency telephone number

For medical advice (in German and English):
+49 (0)551 192 40 (Giftinformationszentrum Nord)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification in accordance with Regulation (EC) No 1272/2008 (CLP)
Flam. Gas 1A; H220
Press. Gas liq.; H280

Classification information
This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:
Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP
Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3 and 4 of Annex I to CLP.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)

Product identifier
74-98-6 (propane)

Hazard pictograms


GHS02


GHS04

Signal word
Danger

Hazard statement(s)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Precautionary statement(s)

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	In case of leakage, eliminate all ignition sources.
P410+P403	Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards

Liquefied gas can cause severe frostbite and eye damage. Vapours in higher concentrations may have a narcotic effect.
Vapours may form explosive mixtures with air. Vapours are heavier than air and spread over the ground. This product does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

PBT assessment
The product is not considered to be a PBT.

vPvB assessment
The product is not considered to be a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical characterization

Substance name	propane
Formula	C3H8
Molecular weight	44,09

Identification numbers

CAS no.	74-98-6
EC no.	200-827-9
Index no.	601-003-00-5

Components to be mentioned according to Regulation (EU) No. 1907/2006, Annex II, section 3.1

Substance name	Additional information	
CAS / EC / Index / REACH no	Concentration	%
butane	impurity	
106-97-8 203-448-7 601-004-00-0 -	<= 2,00	wt%
isobutane	impurity	
75-28-5 200-857-2 601-004-00-0 -	<= 2,00	wt%

Other information

Note	Specific concentration limits	M-factor (acute)	M-factor (chronic)
U	-	-	-

Full text for the notes: pls. see section 16 “Notes relating to the identification, classification and labelling of substances ((EC) No 1272/2008, Annex VI)”.

3.2 Mixtures
Not applicable. The product is not a mixture.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information
In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove affected person from danger area, lay him down. Seek medical advice immediately.

After inhalation
Remove affected persons from dangerous area by observing suitable respiratory protection measures. Ensure supply of fresh air. Irregular breathing/no breathing: artificial respiration. Call a doctor immediately.

After skin contact
In case of contact with skin wash off immediately with soap and water. In case of frostbite, rinse with plenty of water. Do not remove clothing.

After eye contact
Remove contact lenses. Rinse eye thoroughly under running water keeping eyelids wide open and protecting the unaffected eye (at least 10 to 15 minutes).

After ingestion
Rinse the mouth thoroughly with water. Do not induce vomiting. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms
Shortness of breath; Frostbite; respiratory arrest. Unconsciousness

4.3 Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Extinguishing powder; Water spray jet; Foam; Carbon dioxide

Unsuitable extinguishing media
High power water jet

5.2 Special hazards arising from the substance or mixture
In the event of fire, the following can be released: Carbon monoxide and carbon dioxide; May explode if exposed to heat. Liquefied gas: Spilled liquid can cause cold burns. This gas is heavier than air and may accumulate in low areas. Vapours can form a highly flammable mixture with air.

5.3 Advice for firefighters
Use self-contained breathing apparatus. Wear full protective suit. Containers close to fire should be transferred to a safe place. Cool closed containers exposed to fire with water. Pressure increase, bursting and explosion hazard during heating. Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Refer to protective measures listed in sections 7 and 8. Ensure adequate ventilation. Keep away from ignition sources. Do not breathe gas. Cordon and mark contaminated area. Remove persons to safety. Risk of explosion.

For emergency responders
No data available. Personal protective equipment (PPE) - see Section 8.

6.2 Environmental precautions
Avoid release in the environment. Suppress gases/vapours/mists with water spray jet.

6.3 Methods and material for containment and cleaning up
Ensure adequate ventilation. Dispose of absorbed material in accordance with the regulations.

6.4 Reference to other sections
Information regarding safe handling, see section 7. Information regarding personal protective measures, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Only qualified and trained persons are authorised to handle. Provide good ventilation at the work area (local exhaust ventilation, if necessary). To be used only according to instructions for use. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers heat or sources of ignition. In case of accidental release: danger due to low temperature of the liquid product. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Comply with the health and safety at work laws.

General protective and hygiene measures
Wash hands before breaks and after work. Do not inhale gases. Do not eat, drink or smoke during work time. Keep away from foodstuffs and beverages. Have emergency shower available.

Advice on protection against fire and explosion
Vapours can form an explosive mixture with air. Isolate from sources of heat, sparks and open flame. Take precautionary measures against electrostatic loading (earthing necessary during loading operations). Use explosion-proof equipment/fittings and non-sparking tools. Electrical equipment should be protected to the appropriate standard.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions
Keep container tightly closed in a cool, well-ventilated place, open and handle carefully. Protect from heat and direct sunlight.

Recommended storage temperature

Value	<	50	°C

Requirements for storage rooms and vessels
Containers which are opened must be carefully closed and kept upright to prevent leakage. Always keep in containers of same material as the original.

Appropriate Material	steel

Incompatible products
Substances to be avoided, see section 10.

Stoarge Class according TRGS 510

2A	Gases (except aerosol dispensers and lighters)

7.3 Specific end use(s)
No data available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values

No	Substance name	CAS no.		EC no.	
1	**propane**	**74-98-6**		**200-827-9**	
	TRGS 900				
	Propan				
	WEL long-term (8-hr TWA reference period)	1800	mg/m³	1000	ml/m³
	Ceiling Limit	4(II)			
2	**butane**	**106-97-8**		**203-448-7**	
	TRGS 900				
	Butan				
	WEL long-term (8-hr TWA reference period)	2400	mg/m³	1000	ml/m³
	Ceiling Limit	4(II)			
3	**isobutane**	**75-28-5**		**200-857-2**	
	TRGS 900				
	Isobutan				
	WEL long-term (8-hr TWA reference period)	2400	mg/m³	1000	ml/m³
	Ceiling Limit	4(II)			

8.2 Exposure controls

Appropriate engineering controls
Ensure adequate ventilation, local exhaust at the work station if necessary. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

Personal protective equipment

Respiratory protection
In case of insufficient ventilation or long-term effect use breathing apparatus. Breathing apparatus: gas filter AX, code colour: brown

Eye / face protection
Tightly fitting safety glasses (EN 166).

Hand protection
Low-temperature-resistant gloves (EN 511). Sufficient protection is given wearing suitable protective gloves checked according to i.e. EN 374, in the event of risk of skin contact with the product. Before use, the protective gloves should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations thus to avoid permanent use of protective gloves.
Appropriate Material Leather

Other
Chemical-resistant work clothes. Fire-resistant antistatic protective clothing. Protective shoes.

Environmental exposure controls
No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

State of aggregation
gas

Form
liquified gas

Colour
colourless

Odour
characteristic

pH value	
Not applicable	
Source	supplier

Boiling point / boiling range		
Value	-42,1	°C
Reference pressure	101,32	kPa
Source	supplier	

Melting point/freezing point		
Value	-187,6	°C
Source	supplier	

Decomposition temperature
No data available

Pour point	
Not applicable	
Source	supplier

Flash point		
Value	-80	°C
Source	supplier	

Ignition temperature		
Value	450	°C
Source	supplier	

Explosive properties
May form explosive gas-air mixtures.

Flammability	
Extremely flammable gas.	
Source	supplier

Lower explosion limit		
Value	2,10	% vol
Source	ECHA	

Upper explosion limit		
Value	9,50	% vol
Source	ECHA	

Vapour pressure		
Value	8300	hPa
Reference temperature	20	°C
Source	supplier	

Relative vapour density
No data available

Relative density
No data available

Density		
Value	0,493	g/cm³
Reference temperature	25	°C
Source	supplier	

Bulk density	
Not applicable	
Source	supplier

Solubility in water

Value	<	0,1	g/l
Source	supplier		

Solubility
No data available

Partition coefficient n-octanol/water (log value)			
No	**Substance name**	**CAS no.**	**EC no.**
1	**propane**	**74-98-6**	**200-827-9**

log Pow		2,36	
Reference temperature		20	°C
with reference to	pH 7		
Source	ECHA		

Kinematic viscosity	
Not applicable	
Source	supplier

Solids content
Not applicable

Particle characteristics
No data available

9.2 Other information

Other information
Critical Temp.: 96,7 °C

SECTION 10: Stability and reactivity

10.1 Reactivity
Dangerous reactions are not expected if the product is handled according to its intended use.

10.2 Chemical stability
Stable under recommended storage and handling conditions (See section 7).

10.3 Possibility of hazardous reactions
Risk of formation of explosive gas mixtures in air. May ignite when exposed to strong oxydising agents.

10.4 Conditions to avoid
Heat, naked flames and other ignition sources. Contact with incompatible substances.

10.5 Incompatible materials
strong oxidizing agents; Chlorine; Hydrogen chloride; Fluorine; oxygen

10.6 Hazardous decomposition products
None if stored, handled and transported properly. In case of fire: see section 5.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute oral toxicity
No data available

Acute dermal toxicity
No data available

Acute inhalational toxicity				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
LC50	>	800000	ppmV	
Duration of exposure		0,25	h	

State of aggregation	Gas
Species	rat
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.

Skin corrosion/irritation
No data available

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**propane**	**74-98-6**	**200-827-9**

Type of examination	in vitro gene mutation study in bacteria
Species	Salmonella typh. TA98, TA100, TA1535, TA1537, TA1538
Method	OECD 471
Source	ECHA
Evaluation/classification	Based on available data, the classification criteria are not met.

Reproduction toxicity			
No	**Substance name**	**CAS no.**	**EC no.**
1	**propane**	**74-98-6**	**200-827-9**

Route of exposure	inhalational	
NOAEC	12000	ppm
Type of examination	Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test	
Species	rat	
Method	OECD 422	
Source	ECHA	
Evaluation/classification	Based on available data, the classification criteria are not met.	

Carcinogenicity
No data available

STOT - single exposure
No data available

STOT - repeated exposure			
No	**Substance name**	**CAS no.**	**EC no.**
1	**propane**	**74-98-6**	**200-827-9**

Route of exposure	inhalational	
NOAEC	7214	mg/m³
Species	rat	
Method	OECD 422	
Source	ECHA	
Evaluation/classification	Based on available data, the classification criteria are not met.	

Aspiration hazard
No data available

11.2 Information on other hazards

Endocrine disrupting properties
No data available

Other information
No data available.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish (acute)				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
LC50	appr.	53,1		mg/l
Duration of exposure		96		h
Species	fish			
Method	QSAR			
Source	ECHA			
Evaluation/classification	Based on available data, the classification criteria are not met.			

Toxicity to fish (chronic)				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
NOEC	appr.	3,6		mg/l
Duration of exposure		30		day(s)
Species	fish			
Method	(Q)SAR			
Source	ECHA			
Evaluation/classification	Based on available data, the classification criteria are not met.			

Toxicity to Daphnia (acute)				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
EC50	appr.	29,6		mg/l
Duration of exposure		48		h
Species	Daphnia			
Method	QSAR			
Source	ECHA			
Evaluation/classification	Based on available data, the classification criteria are not met.			

Toxicity to Daphnia (chronic)				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
NOEC		1,95		mg/l
Duration of exposure		30		day(s)
Species	Daphnia magna			
Method	QSAR			
Source	ECHA			
Evaluation/classification	Based on available data, the classification criteria are not met.			

Toxicity to algae (acute)				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
EC50	appr.	20.6		mg/l
Duration of exposure		72		h
Species	Green algae			
Method	QSAR			
Source	ECHA			
Evaluation/classification	Based on available data, the classification criteria are not met.			

Toxicity to algae (chronic)
No data available

Bacteria toxicity
No data available

12.2 Persistence and degradability

Biodegradability			
No	**Substance name**	**CAS no.**	**EC no.**

1	propane	74-98-6		200-827-9
Type		aerobic biodegradation		
Value			50	%
Duration			3	d
Method		QSAR		
Source		ECHA		
Evaluation		readily biodegradable		

12.3 Bioaccumulative potential

Partition coefficient n-octanol/water (log value)				
No	**Substance name**	**CAS no.**		**EC no.**
1	**propane**	**74-98-6**		**200-827-9**
log Pow			2,36	
Reference temperature			20	°C
with reference to		pH 7		
Source		ECHA		

12.4 Mobility in soil

Results of PMT and vPvM assessment			
No	**Substance name**	**CAS no.**	**EC no.**
1	**propane**	**74-98-6**	**200-827-9**
PMT assessment		The substance is not PMT.	
vPvM assessment		The substance is not vPvM.	
Source		ECHA	

12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	
Product Name	
R290, Tegan®290, Propane 2.5	
PBT assessment	The product is not considered to be a PBT.
vPvB assessment	The product is not considered to be a vPvB.

No	Substance name	CAS no.	EC no.
1	**propane**	**74-98-6**	**200-827-9**
PBT assessment		The substance is not PBT.	
vPvB assessment		The substance is vPvB.	
Source		ECHA	

12.6 Endocrine disrupting properties

No data available.

12.7 Other adverse effects

No data available.

12.8 Other information

Other information
Do not discharge product unmonitored into the environment.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.
dispose of in accordance with local regulation.

Packaging
Compressed gas packaging under pressure. Do not open by force. Do not heat above 50°C. Dispose of compressed gas packagings only if completely discharged. Do not burn empty compressed gas packagings. Do not pierce, cut or weld uncleaned containers.

SECTION 14: Transport information

14.1 UN number or ID number

ADR/RID/ADN	UN1978
IMDG	UN1978
ICAO-TI / IATA	UN1978

14.2 UN proper shipping name

ADR/RID/ADN	PROPANE
IMDG	PROPANE
ICAO-TI / IATA	Propane

14.3 Transport hazard class(es)

ADR/RID/ADN - Class	2
Label	2.1 RID: (+13)
Classification code	2F
Tunnel restriction code	B/D
Hazard identification no.	23
IMDG - Class	2.1
Label	2.1
ICAO-TI / IATA - Class	2.1
Label	2.1

14.4 Packing group

ADR/RID/ADN	-
IMDG	-
ICAO-TI / IATA	-

14.5 Environmental hazards

EmS F-D, S-U

14.6 Special precautions for user

To be transported always in closed, upright and safe containers. Make sure that persons handling these containers are aware of the rules of conduct in case of incident or spillage.

14.7 Maritime transport in bulk according to IMO instruments

Not relevant

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No 1907/2006 (REACH) Annex XIV (List of substances subject to authorisation)
In accordance with the REACH regulation (EC) 1907/2006, the product does not contain any substances that are considered as subject to listing in annex XIV, inventory of substances requiring authorisation.

REACH candidate list of substances of very high concern (SVHC) for authorisation
In accordance with article 57 and article 59 of the Reach regulation (EC) 1907/2006, this substance is not considered as subject to listing in annex XIV, inventory of substances requiring authorisation ("Authorization list").

Regulation (EC) No 1907/2006 (REACH) Annex XVII: RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES	
The product is considered being subject to REACH regulation (EC) 1907/2006 annex XVII.	No 40

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances	
This product is subject to Part I of Annex I, risk category:	P2

Other regulations
Adhere to the national sanitary and occupational safety regulations when using this product.

National regulations

Water Hazard Class (Germany)

Class	nwg
Identification number	560
Source	Classification according to AwSV (Regulation on facilities for handling substances that are hazardous to water).

Other regulations
Take into account: TRGS 510 "Storage of hazardous substances in non-stationary containers"

15.2 Chemical safety assessment
A chemical safety assessment has been carried out for this substance.

SECTION 16: Other information

Sources of key data used to compile the data sheet:
Regulation (EC) No 1907/2006 (REACH), 1272/2008 (CLP) as amended in each case.
Directives 2000/39/EC, 2006/15/EC, 2009/161/EU, (EU) 2017/164.
National Threshold Limit Values of the corresponding countries as amended in each case.
Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.
The data sources used to determine physical, toxic and ecotoxic data, are indicated directly in the corresponding section.

Classification information
This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:
Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP
Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3 and 4 of Annex I to CLP.

Notes relating to the identification, classification and labelling of substances and mixtures ((EC) No 1272/2008, Annex VI)

U	When put on the market gases have to be classified as ‘Gases under pressure’, in one of the groups compressed gas, liquefied gas, refrigerated liquefied gas or dissolved gas. The group depends on the physical state in which the gas is packaged and therefore has to be assigned case by case.

Creation of the safety data sheet
UMCO GmbH

This information is based on our present knowledge and experience.
The safety data sheet describes products with a view to safety requirements.
It does not however, constitute a guarantee for any specific product properties and shall not establish a legally valid contractual relationship.

Alterations/supplements:
Alterations to the previous edition are marked in the left-hand margin.

This document is an English translation of the legally compliant safety data sheet of the region Germany. This document, including UFI and emergency telephone number, may only be used for placing on the market in the region Germany.

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